

Project Report
Alaska Public Broadcasting, Inc.
Project Number 0117-DC-2004-15
October 1, 2009 – December 31, 2009

Alaska Rural Communications Service & Satellite Interconnection Revitalization

Project Summary: the ARCS revitalization project is nearing completion and continues to make good progress. The project objective is the restoration of television broadcast programming to bush and rural communities by either repairing or replacing non operational equipment. This includes transmitters, antennas, satellite dishes, receiver/decoders, or towers.

Restoration of service: reliable ARCS service has been restored to more than 100 bush and rural communities where it had been completely off or seriously degraded.

Acquisition and refurbishment of equipment: refurbishing original transmitters saves approximately \$5000 per unit compared to purchase of new systems. We continue to cycle rebuilt units to the villages and bring the failed units back from those communities and send them off to the factory for rebuilding. We have rights to use some new receivers to decrease our response time when existing units fail in the villages.

Provision of timely customer support: with a system that includes more than 200 sites, technical staff is kept busy each day with myriad general service and trouble calls involving unique factors and circumstances to analyze and address. The range of work can run from a simple reset to a complex set of problems which have resulted in the complete failure of a village's local service.

Establishment of community partnerships: the majority of the service restoration work is attained through partnership, technical staff working with dedicated community volunteers. Some sites and projects require staff travel in order to deal with the extraordinary circumstances.

Phases two and three are complete: modern technology based systems have been designed and implemented allowing for consolidation of a delivery system and central point of control for multiple content streams. A new method of controlling the ARCS program schedule is fully operational, allowing for remote operation. Equipment purchase and installation of the new State of Alaska satellite uplink system became operational on January 25, 2007.

The overall project is on schedule and within budget. We have not encountered any serious unanticipated problems or set backs requiring significant changes to the work scope. Restoration or upgrading of service presents a different challenge in each community. In partnership with our community liaisons, we continue to identify and solve these problems.

Activity detail: October 1, 2009 – December 31, 2009

- ARCS Technical Support handled 130 calls for assistance from 35 different bush and rural communities serviced by ARCS. As email has become more readily available in the villages we see on average around two dozen email contacts per month that in the past would have been phone calls.
- Aniak: A fire at the village community hall destroyed part of the structure and threatened the ARCS equipment. The AC power feed to the building was shut down and that did

take ARCS off the air for a few days while the fire was investigated. As it turns out the area of the building where ARCS equipment is housed was not damaged by the fire and service was restored.

- Gambell: The ARCS dish was damaged and service interrupted when at least one snow machine passed through an area not designated for traffic, catching hold of the RF line to the receiver, and tearing the cable out of its housing on the LNB. In the process, the LNB, feed horn, and feed arms were all damaged. Replacement cable, LNB and receiver have all been sent, and the local volunteer has tried to reconstruct the feed arms, but we are still working to get service restored.
- Gustavus: Another transmitter was sent after problems with local reception cropped up. In addition it was discovered that the ARCS equipment had been disconnected from its power conditioner. As of the end of December service has been steady and good.
- We are in the process of replacing all the inside electronics at Hughes after discovering that both the satellite receiver and modulator would not power up. A new line conditioner will be included in the complement of equipment to protect from fluctuations in the town's generated power.
- Mekoryuk: After all the work spent last quarter to put their ARCS system back on the air, in late December the RF cable was reported broken and a replacement requested. However, after the new cable was installed, the LNB turned out to also have been damaged, probably from a short circuit, and was also replaced before service was restored.
- Perryville: Reports of problems with reception started in November, but not until December did we discover the satellite receiver was probably the culprit. A replacement was installed confirming our suspicions and restoring service.
- Tolsona: Cooling fans inside the transmitter began to fail and were replaced. New generation transmitters have fans to abate heat from the amplifier, whereas old transmitters use passive cooling fans bolted to their backs. The new fans are more efficient at removing heat but present an additional fail point. They can cause a transmitter to shut down if they are not kept clean, as dust build up and will clog the airway. When heat cannot be removed fast enough the transmitter will automatically shut down until it cools.
- Pilot Point: We replaced a receive cable damaged and fraying with a new one and restored service. The modulator was replaced in Port Lions, but local residents were still not receiving the channel because when the local volunteers installed it there was not follow-up with our office. Even though the modulator was working, power to the transmitter was not turned on. After enough calls disrupted the city offices daily work, they called the toll free line and, with a little help from us, service was restored.
- Willow Mountain: this site serves communities along a 30 mile stretch of highway adjacent to the TransAlaska Pipeline. It is the most remote site in the ARCS system, sitting atop the 3,300 foot Willow Mountain, where it can see as far north as Glennallen and as far south and east as Kenny Lake. It picks up the satellite signal at the Tazlina DOT camp and uses a 20+ year old analog microwave system to beam video and audio to the mountaintop where it enters our transmitter for distribution to the viewers. It is an increasingly problematic link, and we were lucky in December when it failed to get the help of a retired engineer in the area who helped get the system at the lower site working again. This site will need a major equipment refresh if it is to keep providing service to the area.
- In December the APBI and ARCS staff worked closely with state and federal emergency preparedness officials to participate in the first ever test of the "Live EAN code" as part of the nation's EAS plan. The test was conducted the first week of January, and ARCS

performed well, successfully receiving and relaying the message across Alaska to viewers in remote communities, as well as to other radio and television broadcasters who use the ARCS signal as part of their own EAS compliance. More details on this event will be posted in next quarter's report.

In December we received all of our outstanding refurbishment orders back in the office. All except two of the receivers were repaired. We now have enough capacity to cycle good equipment into failed systems for the next couple of months. However, the stack of dead equipment is already growing.

Alaska Public Broadcasting Digital Distribution Network

Project Summary: project objective is interconnection of public broadcasting system facilities by means of the internet or constructed intranet. Upon completion of the network, delivery of content - programming, data and voice - and access to advanced networking options will be available to the system, enhancing service to local, regional and statewide audiences. The project is based on a network design developed under a previous federal grant from the US Department of Commerce. The project began in March 2004 and milestones include:

Review of network design and work scope: a thorough review of the original design and work scope was completed to determine if the selected equipment was still the best choice.

University of Alaska partnership agreement: entered into a multi year agreement with the UA statewide office of information technology for provision of connectivity between the hubs via the UA data backbone; and operational oversight of the network on a twenty-four hour basis. This oversight provides rapid reporting of problems so system maintenance and repair can be provided with minimal down time for network users.

Equipment bids, purchase and deployment: the core equipment for the hub and control locations was installed in August, 2005. Since then, data network equipment for 26 stations has been installed. Competitive bidding has yielded average discount of 31% saving \$465,000.

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All sites have been installed and efforts are focused on operations and maintenance. Current activity is occasional technical assistance being provided to personnel at various sites.